AMENDMENTS TO THE CLAIMS

Claims 1-22 (Canceled).

23. (Previously presented) A method of distinguishing explosives and controlled substances from confounders in an object, comprising:

transporting the object through a cavity in a shielded apparatus, said cavity comprising one or more turns which preclude a straight line trajectory through the cavity;

generating neutron particles from a plurality of neutron sources by pulsing the neutron sources simultaneously, each source having an intensity of about 10^7 neutrons/second or less;

irradiating the object with the neutron particles wherein the object generates gamma rays;

detecting the gamma rays with a plurality of gamma ray detectors;

analyzing the gamma counts associated with the object; and

determining that an explosive or controlled substance is present in the object when the relative atomic percentages of elements comprising the object are substantially similar to the relative atomic percentages of elements associated with known explosives and controlled substances, and

pulsing the neutron sources sequentially after determining that an explosive or controlled substance is present in the object.

24. (Currently amended) A method of detecting explosives and controlled substances in an object comprising confounders, the method comprising:

irradiating the object with neutron particles from a plurality of neutron sources by pulsing the neutron sources simultaneously;

detecting gamma rays emitted by substances contained within the object in response to the irradiation;

determining gamma counts with a plurality of gamma ray detectors;

isolating common eigen value signatures of the substances contained within the object;

analyzing the common eigen value signatures using a plurality of analytical tools to produce a plurality of analyses; [[and]]

subjecting the plurality of analyses to a hierarchy of classifiers to determine if an explosive or controlled substance is present in the object; and

pulsing the neutron sources sequentially after determining that an explosive or controlled substance is present in the object.

25. (Original) The method of claim 23, wherein the cavity is surrounded by water.

26. (Previously presented) The method of claim 23, wherein the neutron particles comprise 14.7 MeV neutrons.

27-28. (Canceled)

29. (Original) The method of claim 23, wherein the object is irradiated a first time and at least a second time.

30. (Original) The method of claim 29, wherein the neutron particles are generated by pulsing the neutron sources simultaneously at the first time.

31. (Original) The method of claim 30, wherein the neutron particles are generated by pulsing the neutron sources sequentially at the at least a second time.

32. (Original) The method of claim 23, wherein the plurality of neutron sources comprises at least 10 neutron sources.

33. (Cancelled)

34. (Original) The method of claim 23, wherein the plurality of gamma ray detectors comprises at least 100 gamma ray detectors.

35. (Canceled)

36. (Previously presented) The method of claim 23, wherein the array is arranged such that an equal number of neutron sources are disposed on at least two sides of the array.

37. (Original) The method claim 36, wherein each neutron source irradiates a predetermined area of the object.

38. (Previously presented) The method claim 23, wherein the array further comprises the plurality of gamma ray detectors.

39. (Canceled).

40. (Previously presented) The method of claim 38, wherein the array is arranged such that an equal number of gamma ray detectors are disposed on at least two sides of the array.

41. (Previously presented) The method of claim 23, wherein the cavity further comprises a transport mechanism for moving the object through the cavity.

42. (Original) The method claim 41, wherein the array is disposed inside the cavity and the object passes through the array as the transport mechanism moves the object through the cavity.

43. (Previously presented) The method of claim 23, wherein the elements comprising the explosives and controlled substances are selected from the group consisting of carbon, oxygen, and nitrogen.

44. (Original) The method of claim 23, wherein the explosives and controlled substances are selected from the group including TNT, PETN, RDX, HMX, Ammonium Nitrate, Plutonium, Uranium, and drugs.

45. (Previously presented) The method of claim 44, wherein the energies of gamma counts associated with carbon, oxygen, and nitrogen are 4.43 MeV, 6.14 MeV, and 2.31 MeV, respectively.

46. (Original) The method of claim 23, further comprising determining whether a confounder is present in the object when the relative atomic percentages of elements comprising the controlled substances are substantially similar to the relative atomic percentages of elements associated with known confounders.

47. (Previously presented) The method of claim 46, wherein the confounders are selected from a group consisting of nylon and food.

48. (Previously presented) The method of claim 23, wherein the shielded apparatus has dimensions of no more than six meters in length, three meters in width, and three meters in height.

49. (Currently amended) A method of detecting explosives and controlled substances in an object comprising confounders, the method comprising:

irradiating the object with neutron particles a first time from a plurality of neutron sources by pulsing the neutron sources simultaneously wherein the object generates gamma rays;

detecting the gamma rays emitted by substances contained within the object in response to the irradiation;

determining gamma counts with a plurality of gamma ray detectors;

isolating common eigen value signatures of the substances contained within the object to generate signature data;

forming a correlation function of the signature data;

decomposing wavelets of the correlation function of the signature data; [[and]]

comparing the incoming decomposed signature data with a library of signatures to determine if an explosive or controlled substance is present in the object; and

irradiating the object with neutron particles a second time by pulsing the neutron sources sequentially if it is determined that an explosive or controlled substance is present in the object.